

NODE=B004

***N(1895) 1/2<sup>-</sup>***

$I(J^P) = \frac{1}{2}(\frac{1}{2}^-)$  Status: \*\*

## OMITTED FROM SUMMARY TABLE

Before our 2012 Review, this state appeared in our Listings as the *N*(2090). Any structure in the  $S_{11}$  wave above 1800 MeV is listed here. A few early results that are now obsolete have been omitted.

The latest GWU analysis (ARNDT 06) finds no evidence for this resonance.

***N(1895) BREIT-WIGNER MASS***

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>≈ 2090 OUR ESTIMATE</b>			
1895±15	ANISOVICH	12A	DPWA Multichannel
2180±80	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
1880±20	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1910±15	SHRESTHA	12A	DPWA Multichannel
1812±25	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1822±43	VRANA	00	DPWA Multichannel
1897±50 <sup>+30</sup> <sub>-2</sub>	PLOETZKE	98	SPEC $\gamma p \rightarrow p\eta'(958)$
1928±59	MANLEY	92	IPWA $\pi N \rightarrow \pi N & N\pi\pi$

NODE=B004M

NODE=B004M  
→ UNCHECKED ←***N(1895) BREIT-WIGNER WIDTH***

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
90 <sup>+ 30</sup> <sub>- 15</sub>	ANISOVICH	12A	DPWA Multichannel
350±100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
95±30	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
502±47	SHRESTHA	12A	DPWA Multichannel
405±40	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
248±185	VRANA	00	DPWA Multichannel
396±155 <sup>+35</sup> <sub>-45</sub>	PLOETZKE	98	SPEC $\gamma p \rightarrow p\eta'(958)$
414±157	MANLEY	92	IPWA $\pi N \rightarrow \pi N & N\pi\pi$

NODE=B004W

NODE=B004W

***N(1895) POLE POSITION***

REAL PART	DOCUMENT ID	TECN	COMMENT
<i>VALUE (MeV)</i>			
1900±15	ANISOVICH	12A	DPWA Multichannel
2150±70	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
1937 or 1949	<sup>1</sup> LONGACRE	78	IPWA $\pi N \rightarrow N\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1858	SHRESTHA	12A	DPWA Multichannel
1797±26	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1795	VRANA	00	DPWA Multichannel

NODE=B004215

NODE=B004RE  
NODE=B004RE

-2×IMAGINARY PART	DOCUMENT ID	TECN	COMMENT
<i>VALUE (MeV)</i>			
90 <sup>+ 30</sup> <sub>- 15</sub>	ANISOVICH	12A	DPWA Multichannel
350±100	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
139 or 131	<sup>1</sup> LONGACRE	78	IPWA $\pi N \rightarrow N\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
479	SHRESTHA	12A	DPWA Multichannel
420±45	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
220	VRANA	00	DPWA Multichannel

NODE=B004IM  
NODE=B004IM

**N(1895) ELASTIC POLE RESIDUE****MODULUS  $|r|$** 

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
1 ± 1	ANISOVICH	12A	DPWA Multichannel
40 ± 20	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
60	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$

**PHASE  $\theta$** 

VALUE (°)	DOCUMENT ID	TECN	COMMENT
0 ± 90	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-164	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$

**N(1895) INELASTIC POLE RESIDUE**

The "normalized residue" is the residue divided by  $\Gamma_{pole}/2$ .

**Normalized residue in  $N\pi \rightarrow N(1895) \rightarrow N\eta$** 

MODULUS (%)	PHASE (°)	DOCUMENT ID	TECN	COMMENT
6 ± 2	40 ± 20	ANISOVICH	12A	DPWA Multichannel

**Normalized residue in  $N\pi \rightarrow N(1895) \rightarrow \Lambda K$** 

MODULUS (%)	PHASE (°)	DOCUMENT ID	TECN	COMMENT
5 ± 2	-90 ± 30	ANISOVICH	12A	DPWA Multichannel

**Normalized residue in  $N\pi \rightarrow N(1895) \rightarrow \Sigma K$** 

MODULUS (%)	PHASE (°)	DOCUMENT ID	TECN	COMMENT
6 ± 2	40 ± 30	ANISOVICH	12A	DPWA Multichannel

**N(1895) DECAY MODES**

Mode
$\Gamma_1 N\pi$
$\Gamma_2 N\eta$
$\Gamma_3 \Lambda K$
$\Gamma_4 \Sigma K$
$\Gamma_5 N\pi\pi$
$\Gamma_6 \Delta\pi$
$\Gamma_7 \Delta(1232)\pi, D\text{-wave}$
$\Gamma_8 N\rho$
$\Gamma_9 N\rho, S=1/2, S\text{-wave}$
$\Gamma_{10} N\rho, S=3/2, D\text{-wave}$
$\Gamma_{11} N(\pi\pi)_{S\text{-wave}}^{I=0}$
$\Gamma_{12} N(1440)\pi$
$\Gamma_{13} p\gamma, \text{helicity}=1/2$
$\Gamma_{14} n\gamma, \text{helicity}=1/2$

NODE=B004220

NODE=B004RER  
NODE=B004RERNODE=B004IMR  
NODE=B004IMR

NODE=B004240

NODE=B004240

NODE=B004RS1  
NODE=B004RS1NODE=B004RS2  
NODE=B004RS2NODE=B004RS3  
NODE=B004RS3

NODE=B004225; NODE=B004

DESIG=1

DESIG=11

DESIG=2

DESIG=12

DESIG=3

DESIG=4

DESIG=5

DESIG=6

DESIG=7

DESIG=8

DESIG=9

DESIG=10

DESIG=13

DESIG=14

**N(1895) BRANCHING RATIOS**

$\Gamma(N\pi)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
2 ± 1	ANISOVICH	12A	DPWA Multichannel	
18 ± 8	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$	
9 ± 5	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
17 ± 2	SHRESTHA	12A	DPWA Multichannel	
32 ± 6	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$	
17 ± 3	VRANA	00	DPWA Multichannel	
10 ± 10	MANLEY	92	IPWA $\pi N \rightarrow \pi N & N\pi\pi$	

NODE=B004230

NODE=B004R1  
NODE=B004R1

$\Gamma(N\eta)/\Gamma_{\text{total}}$	$\Gamma_2/\Gamma$	NODE=B004R11 NODE=B004R11
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
21 ± 6	ANISOVICH 12A DPWA Multichannel	
41 ± 4	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
40 ± 4	SHRESTHA 12A DPWA Multichannel	
22 ± 10	BATINIC 10 DPWA $\pi N \rightarrow N\pi, N\eta$	
$\Gamma(\Lambda K)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma$	NODE=B004R12 NODE=B004R12
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
18 ± 5	ANISOVICH 12A DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
1.8 ± 0.8	SHRESTHA 12A DPWA Multichannel	
$\Gamma(\Sigma K)/\Gamma_{\text{total}}$	$\Gamma_4/\Gamma$	NODE=B004R13 NODE=B004R13
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
13 ± 7	ANISOVICH 12A DPWA Multichannel	
$(\Gamma_1\Gamma_f)^{1/2}/\Gamma_{\text{total}}$ in $N\pi \rightarrow N(1895) \rightarrow \Lambda K$	$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$	NODE=B004R2 NODE=B004R2
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
not seen	SAXON 80 DPWA $\pi^- p \rightarrow \Lambda K^0$	
$\Gamma(\Delta(1232)\pi, D\text{-wave})/\Gamma_{\text{total}}$	$\Gamma_7/\Gamma$	NODE=B004R5 NODE=B004R5
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
1 ± 1	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
7 ± 3	SHRESTHA 12A DPWA Multichannel	
$\Gamma(N\rho, S=1/2, S\text{-wave})/\Gamma_{\text{total}}$	$\Gamma_9/\Gamma$	NODE=B004R7 NODE=B004R7
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
36 ± 1	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
< 2	SHRESTHA 12A DPWA Multichannel	
$\Gamma(N\rho, S=3/2, D\text{-wave})/\Gamma_{\text{total}}$	$\Gamma_{10}/\Gamma$	NODE=B004R8 NODE=B004R8
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
1 ± 1	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
9 ± 3	SHRESTHA 12A DPWA Multichannel	
$\Gamma(N(\pi\pi)^{I=0}_{S\text{-wave}})/\Gamma_{\text{total}}$	$\Gamma_{11}/\Gamma$	NODE=B004R9 NODE=B004R9
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
2 ± 1	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
< 2	SHRESTHA 12A DPWA Multichannel	
$\Gamma(N(1440)\pi)/\Gamma_{\text{total}}$	$\Gamma_{12}/\Gamma$	NODE=B004R10 NODE=B004R10
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
2 ± 1	VRANA 00 DPWA Multichannel	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
24 ± 4	SHRESTHA 12A DPWA Multichannel	
<b><math>N(1895)</math> PHOTON DECAY AMPLITUDES</b>		
$N(1895) \rightarrow p\gamma, \text{ helicity-1/2 amplitude } A_{1/2}$		NODE=B004235
<u>VALUE (GeV<math>^{-1/2}</math>)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
0.012 ± 0.006	<sup>2</sup> ANISOVICH 12A DPWA Phase = $(120 \pm 50)^\circ$	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
0.012 ± 0.006	SHRESTHA 12A DPWA Multichannel	
$N(1895) \rightarrow n\gamma, \text{ helicity-1/2 amplitude } A_{1/2}$		NODE=B004A1 NODE=B004A1
<u>VALUE (GeV<math>^{-1/2}</math>)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
• • • We do not use the following data for averages, fits, limits, etc. • • •		
0.003 ± 0.007	SHRESTHA 12A DPWA Multichannel	

**N(1895) FOOTNOTES**

<sup>1</sup> LONGACRE 78 values are from a search for poles in the unitarized T-matrix. The first (second) value uses, in addition to  $\pi N \rightarrow N\pi\pi$  data, elastic amplitudes from a Saclay (CERN) partial-wave analysis.

<sup>2</sup> This ANISOVICH 12A value is the complex helicity amplitude at the pole position.

**N(1895) REFERENCES**

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)
BATINIC	10	PR C82 038203	M. Batinic <i>et al.</i>	(ZAGR)
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytman,, T.-S.H. Lee	(PITT+)
PLOETZKE	98	PL B444 555	R. Ploetzke <i>et al.</i>	(Bonn SAPHIR Collab.)
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KSA) IJP
Also		PR D30 904	D.M. Manley <i>et al.</i>	(VPI)
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP
Also		PR D20 2839	R.E. Cutkosky <i>et al.</i>	(CMU, LBL)
SAXON	80	NP B162 522	D.H. Saxon <i>et al.</i>	(RHEL, BRIS) IJP
HOEHLER	79	PDAT 12-1	G. Höhler <i>et al.</i>	(KARLT) IJP
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP
LONGACRE	78	PR D17 1795	R.S. Longacre <i>et al.</i>	(LBL, SLAC)

NODE=B004

NODE=B004;LINKAGE=L8

NODE=B004A1;LINKAGE=AN

NODE=B004

REFID=54041

REFID=54862

REFID=53552

REFID=51535

REFID=47593

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